



Trial: 2006-Headline Corn

The effect of Headline® fungicide on the yield of four corn hybrids.

Bruce Potter, Jeff Irlbeck and Jodie Getting, University of Minnesota Department of Entomology and Southwest Research and Outreach Center

Summary

Headline fungicide was applied at the R1 stage of 4 corn hybrids (Croplan 491 YGCB , Croplan 421 YGCB , Pioneer 37F74 HX and Pioneer38H64 HX . No differences in plant health or disease were observed. Yield differences between hybrids were observed. Across and within hybrids fungicide did not increase corn yields.

Background & Objective

The strobilurin fungicide, Headline®, has recently been labeled for use on field corn. This trial is an initial attempt to examine the effect of prophylactic foliar fungicides on yield of several similar maturity corn hybrids under Minnesota growing conditions.

Site and application description

The trial was planted at the University of Minnesota, Southwest Research and Outreach Center near Lamberton, Redwood County, Minnesota. Site and treatment application details are shown in table 1 and 2 respectively. The Bt corn borer hybrids Croplan 491, Croplan 421, Pioneer 37F74 and Pioneer 38H64 were planted in a split plot design with six replications on May 8, 2006. Main plots were fungicide treated or untreated and subplots were hybrid. Plots were planted with a John Deere Max Emerge planter at 2 inch depth. The previous crop was soybean. Force 3G insecticide at 5 oz. /1000 ft row was applied in a T-band for corn rootworm management based on a history of extended diapause northern corn rootworm. Early season weather was cool and very wet resulting in a less than desirable seedbed. Well above normal rainfall occurred after planting while the latter part of the season was normal to dry. As a result root development was less than optimal. Detailed temperature and rainfall information for this trial can be found at: <http://swroc.coafes.umn.edu/Weather/weather.htm>.

In spite of a wet spring, no significant fungal diseases were observed at the time of fungicide application. Low disease pressure continued until maturity for all varieties and no differences by fungicide treatment were observed. Common corn rust was observed but very late in the growing season. Very isolated plants with anthracnose symptoms were observed. Significant late season lower leaf firing indicative of nitrogen was observed. We attempted to rate all the above even though no obvious differences by variety or fungicide application were observed.

Table 1. Plot information

| | |
|----------------------------|---|
| Site information | |
| Location: | University of Minnesota Southwest Research & Outreach Center |
| County: | Redwood Nearest Town: Lamberton, MN |
| Soil type: | |
| Fertility: | P(Bray): 26 ppm K: 181 ppm pH: 5.6 O.M.% |
| Applied Fertilizer: | November 15, 2005 15-0-0 |
| Plot design: | Split plot 6 replications where main plot = fungicide treatment and subplot = variety |
| Plot size: | 10 foot x 65 foot |
| Plot Maintenance | |
| Previous crop: | Soybean |
| Primary tillage: | Fall 2005 Mulch Till |
| Secondary tillage: | 4/26/2006 Field cultivator 1X |
| Planting date: | May 8, 2006 Row spacing: 30 inch |
| Seeding rate: | 34,000 Seeding depth: 2.0 inches |
| Planting equipment: | John Deere MaxEmerge |
| Cultivar: | Part of trial Trait(s): |
| Weed control: | PPI April 26, 2006 Harness 2.5 pt POST June 22, 2006 Buctril & Atrazine 2 pint |
| Disease control: | Part of trial |
| Insect control: | Force 5 oz T band at planting |

Table 2. Treatment application information

| | |
|----------------------------|-------------------|
| | A |
| Date: | 7/18/2006 |
| Wind: | calm |
| Temperature: | 60 F |
| Relative humidity % | 77 Dew |
| Crop stage: | R1 |
| Crop height: | |
| Volume: | 20 GPA |
| Pressure: | 40PSI |
| Nozzle: | 8003 |
| Nozzle spacing: | |
| Boom height: | 18-20" above crop |
| Hagie hiboy sprayer | |

Results and discussion

Plant injury was not observed with any of the treatments.

The analysis of variance (ANOVA) for Soybean yield and moistures are shown in table 3. Due to the significance of replication for both variables pooled error was not used to calculate mean separations.

Hybrids differed in moisture at harvest.

Croplan 421 had the highest grain yield. Croplan 491 and Pioneer 38H64 had the lowest yield (Table 3, Figure 1).

No difference in yield or moisture by fungicide treatment was observed (Table 3, Figure 2). With 3 of the 4 hybrids a numerical advantage for fungicide was observed. However, yield differences were not significant and an interaction between fungicide and hybrid was not observed (Table 3, Figure 3). An attempt to rate minor leaf disease and lower leaf senescence was made, these differences were slight and analysis did show a relation to hybrid or fungicide treatment. Therefore, these data are not shown.

This trial did not show an economic response for prophylactic fungicide application. However, corn following soybean should be at lower risk for foliar disease than corn following corn. Additionally, late season rainfall was low to moderate. Scouting for early season corn disease combined with awareness of weather forecasts may eventually allow better prediction of economic responses to fungicide applications to field corn.

Table 3. Factorial analysis of variance (ANOVA). The effect of foliar applied fungicides on corn yield. University of Minnesota – Southwest Research and Outreach Center, Lamberton, MN. (2006)B. Potter

| Character Rated | % moisture | Prob (F) | LSD (0.05) | yield BU/acre @15.5% 10/19/2006 | Prob (F) | LSD (0.05) |
|--------------------------|------------|----------|-------------|---------------------------------------|----------|-------------|
| Rating Date | 10/19/2006 | | | | | |
| TABLE OF R MEANS | | 0.0002 | 0.38 | | 0.0294 | 6.41 |
| Replicate 1 | 16.2 b | | | 208.0 a | | |
| Replicate 2 | 16.3 b | | | 201.8 b | | |
| Replicate 3 | 16.4 b | | | 200.2 b | | |
| Replicate 4 | 16.4 b | | | 210.4 a | | |
| Replicate 5 | 16.8 a | | | 204.7 ab | | |
| Replicate 6 | 17.1 a | | | 204.6 ab | | |
| TABLE OF A MEANS | | 0.1219 | N.S. | | 0.3252 | N.S. |
| 1 Headline | 16.6 | | | 206.9 | | |
| 2 Untreated | 16.5 | | | 203.0 | | |
| TABLE OF B MEANS | | 0.0001 | 0.31 | | 0.0001 | 5.24 |
| 1 Croplan 491 | 15.9 d | | | 200.2 c | | |
| 2 Croplan 421 | 16.3 c | | | 213.3 a | | |
| 3 Pioneer 37F74 | 16.7 b | | | 206.2 b | | |
| 4 Pioneer 38H64 | 17.3 a | | | 200.3 c | | |
| TABLE OF AB MEANS | | 0.2713 | N.S. | | 0.4158 | N.S. |
| 1 Headline | 16.0 | | | 203.2 | | |
| 1 Croplan 491 | | | | | | |
| 2 Untreated | 15.8 | | | 197.2 | | |
| 1 Croplan 491 | | | | | | |
| 1 Headline | 16.5 | | | 214.6 | | |
| 2 Croplan 421 | | | | | | |
| 2 Untreated | 16.1 | | | 212.0 | | |
| 2 Croplan 421 | | | | | | |
| 1 Headline | 16.6 | | | 210.0 | | |
| 3 Pioneer 37F74 | | | | | | |
| 2 Untreated | 16.8 | | | 202.4 | | |
| 3 Pioneer 37F74 | | | | | | |
| 1 Headline | 17.4 | | | 200.1 | | |
| 4 Pioneer 38H64 | | | | | | |
| 2 Untreated | 17.2 | | | 200.5 | | |
| 4 Pioneer 38H64 | | | | | | |

Figure 1. Yield comparison for four hybrids with and without fungicide. University of Minnesota – Southwest Research and Outreach Center, Lamberton, MN. (2006) B. Potter

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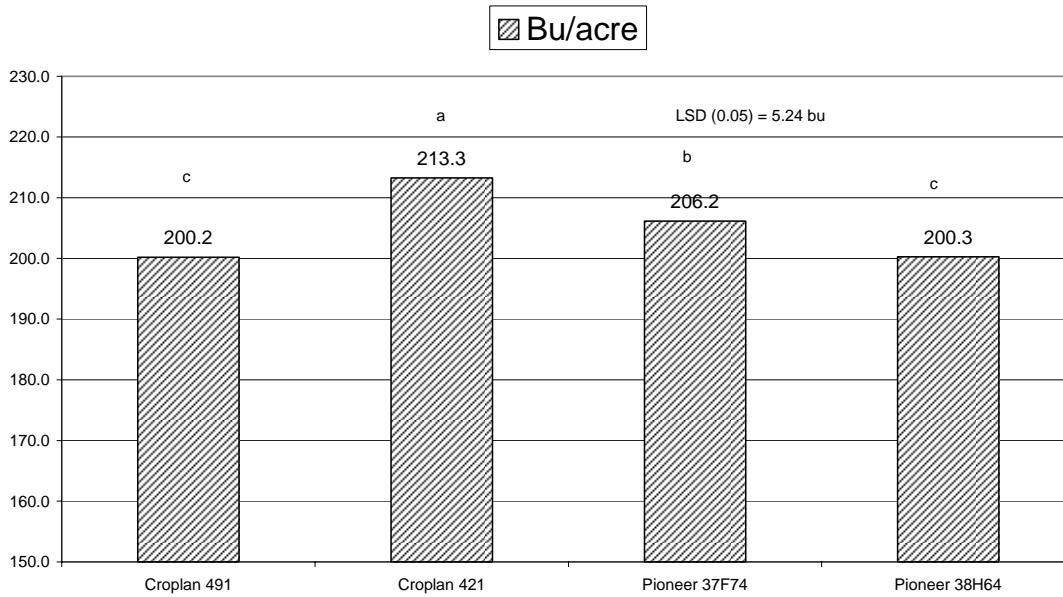
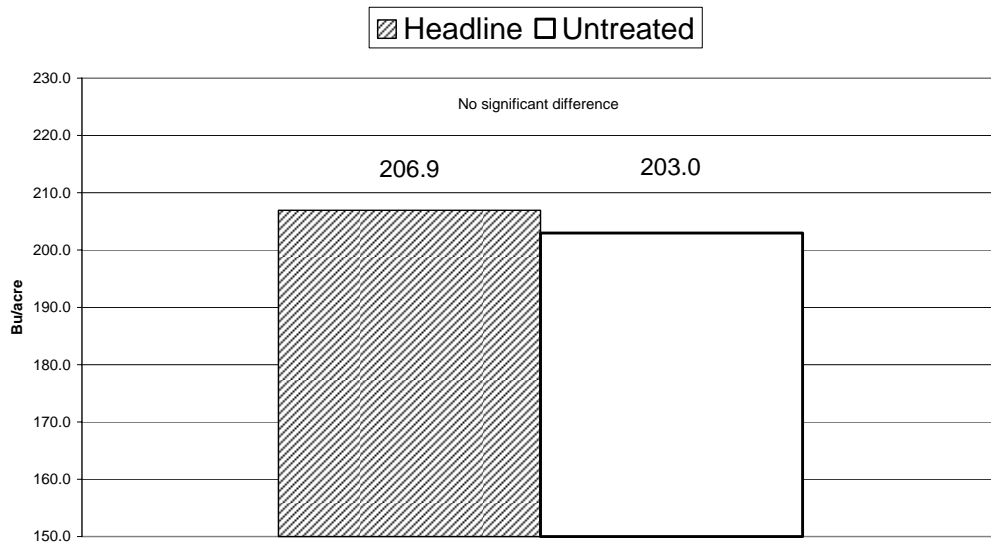
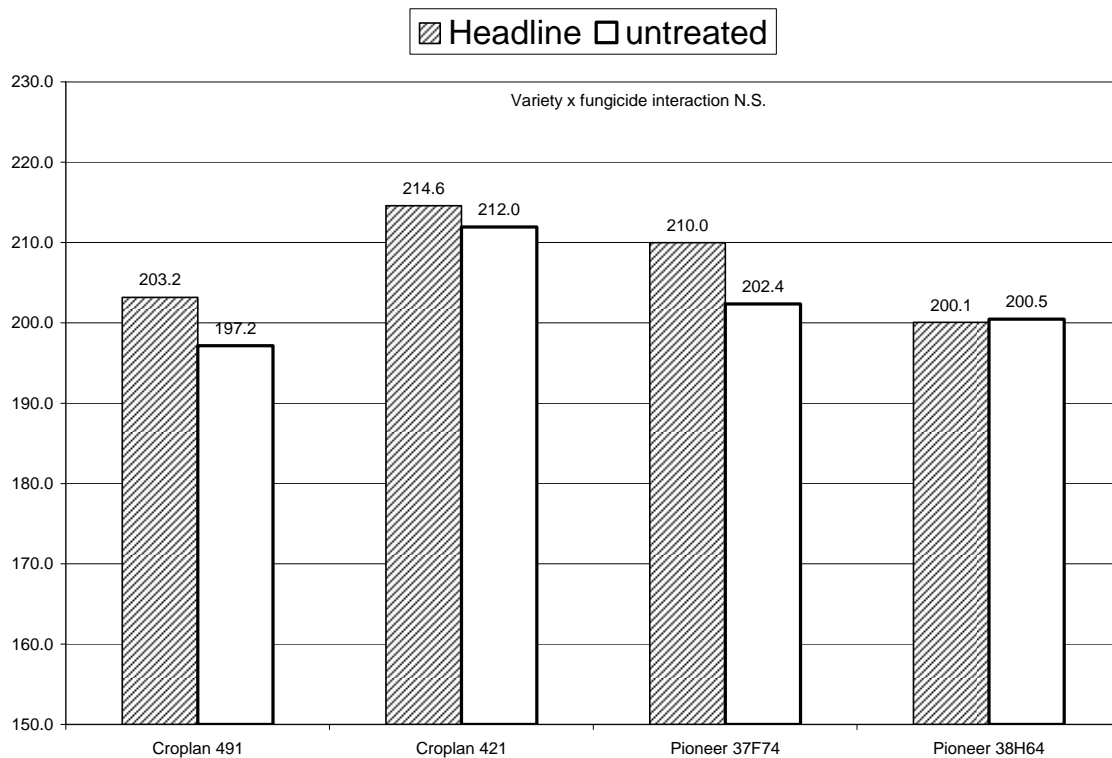


Figure 2. The effect of Headline fungicide on corn yield across four hybrids. University of Minnesota – Southwest Research and Outreach Center, Lamberton, MN. (2006) B. Potter



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Figure 3. The effect of Headline fungicide on the yield four corn hybrids. University of Minnesota – Southwest Research and Outreach Center, Lamberton, MN. (2006) B. Potter



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